UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
2003/01484

April 19, 2004

Mr. Barron Bail
District Manager
BLM - Prineville District
P.O. Box 550
3050 NE 3rd Street
Prineville, OR 97754

Re: Endangered Species Act Section 7 Formal and Informal Consultation and Magnuson-Stevens Fishery Conservation Management Act Essential Fish Habitat Consultation on the Effects of the Central Oregon Resource Area Grazing and Prescribed Burning Programs for 2004-2008, Middle Fork and Lower John Day River Subbasin, Oregon

Dear Mr. Bail:

Enclosed is a document prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries) pursuant to the section 7 of the Endangered Species Act (ESA) on the effects of the Central Oregon Resource Area (CORA) grazing and prescribed burning programs for 2004-2008. NOAA Fisheries concludes in the biological opinion (Opinion) included in this document that the proposed actions in Elsie Martin and West Bologna Creek allotments and prescribed burning are not likely to adversely affect Middle Columbia River (MCR) steelhead (*Onchorynchus mykiss*) or designated critical habitat, and the proposed actions in Belshe, C.H. Hill, Crown Rock, Eakin, Pine Creek, Pryor Farms, and Sixmile Allotments are not likely to jeopardize MCR steelhead or destroy or adversely modify designated critical habitat. As required by section 7 of the ESA, NOAA Fisheries also included reasonable and prudent measures with non-discretionary terms and conditions that NOAA Fisheries believes are reasonable and appropriate to minimize the impact of incidental take associated with these actions.

This document also serves as consultation on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations at 50 CFR Part 600. The Lower John Day River subbasin has been designated as EFH for chinook salmon (*O. tshawytscha*). NOAA Fisheries concludes that the proposed action may adversely affect designated EFH for chinook salmon. As required by section 305(b)(4)(A) of the MSA, included are conservation recommendations that NOAA Fisheries believes will avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from the proposed action. As described in the enclosed consultation, 305(b)(4)(B) of the MSA requires that a Federal action agency must provide a detailed response in writing within 30 days of receiving an EFH conservation recommendation.

If you have any questions regarding this consultation please contact Scott Hoefer of my staff in the Oregon State Habitat Office, at 503.231.6938.

Sincerely,

for Michael R Crouse

D. Robert Lohn
Regional Administrator

cc: Marisa Meyer, USFWS
Roger Williams, MNF
John Morris, BLM
Tim Unterwegner, ODFW

Endangered Species Act - Section 7 Consultation
Biological Opinion

&

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Central Oregon Resource Area Grazing and
Prescribed Burning Programs for Calendar Years 2004-2008

Agency: U.S. Bureau of Land Management

Consultation Conducted By: NOAA's National Marine Fisheries Service, Northwest Region

Date Issued: April 19, 2004

for Michael R Crouse

Issued by: ________________
D. Robert Lohn
Regional Administrator

Refer to: **2003/01484**

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1. INTRODUCTION

1.1 Consultation History

On January 9, 2004, NOAA's National Marine Fisheries Service (NOAA Fisheries) received a letter from the Central Oregon Resource Area (CORA) requesting consultation regarding the potential effects of the proposed calendar years (CY) 2004-2008 livestock grazing program on CORA-administered allotments and prescribed burning in the Lower John Day River (LJDR) subbasin on Middle Columbia River (MCR) steelhead. The accompanying biological assessment (BA) described proposed livestock grazing actions and prescribed burning actions for 2004-2008 on the CORA, as well as the environmental baseline, and the potential effects of those actions on MCR steelhead in the LJDR subbasin within the Prineville District.

A biological opinion was completed on January 17, 2001, for CY 2000 and 2001 grazing activities, and a second biological opinion was completed on October 21, 2002, for CY 2002 and 2003 grazing activities. NOAA Fisheries staff and CORA staff engaged in numerous conversations regarding the grazing program and preparation of the 2004 BA.

The MCR steelhead (*Oncorhynchus mykiss*) was listed as threatened under the Endangered Species Act (ESA) by NOAA Fisheries on March 25, 1999 (64 FR 14517). NOAA Fisheries applied protective regulations to MCR steelhead under section 4(d) of the ESA on July 10, 2000 (65 FR 42422).

The objective of this biological opinion (Opinion) is to determine whether the proposed actions are likely to jeopardize the continued existence of MCR steelhead. The objective of EFH consultation is to determine whether the proposed action may adversely affect designated EFH for relevant species, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH resulting from the proposed action.

1.2 Proposed Action

1.2.1 Livestock Grazing

The BA submitted to NOAA Fisheries on January 9, 2004, describes proposed livestock grazing activities for 2004-2008 on 7 allotments in the LJDR subbasin on the CORA. The BA provided important information for each allotment by pasture (Table 1).

Table 1. Pertinent Allotment Information by Pasture

Allotment	Pasture	Effect	Rosgen Chann. Type	BLM Stream Miles	Hab. Use	Hab. Qual.	Spawn/ Incub. Dates	Rank[1]	Season of Use	S&G Rev.[2]
Belshe	Little Ferry	LAA	B	0.8	Spawn/ Rearing	Poor	2/15-6/15	6	3/1-5/1	2003

Allotment	Pasture	Effect	Rosgen Chann. Type	BLM Stream Miles	Hab. Use	Hab. Qual.	Spawn/ Incub. Dates	Rank[1]	Season of Use	S&G Rev.[2]
	Dan’s	NE	B	0.45	N/A	N/A	N/A	N/A	3/1-7/15	2003
	80	NE	N/A	0.0	N/A	N/A	N/A	N/A	4/1-6/15	2003
	Home-stead	NE	B	0.0	N/A	N/A	N/A	N/A	4/1-6/15	2003
Pine Creek	Zigzag	NLAA	B	0.5	Migra-tion	Fair	2/15-4/15	N/A	3/1-2/28	2005
	North Pole	NE	N/A	0.0	N/A	N/A	N/A	N/A	3/1-2/28	2005
	Porter Canyon	LAA	B	0.25	Spawn/ Rearing	Fair	2/15-6/15	4	3/1-2/28	2005
	Cramer Canyon	LAA	B	1.0	Spawn/ Rearing	Fair	2/15-6/15	3	3/1-2/28	2005
	Bath Canyon	LAA	B	1.5	Spawn/ Rearing	Fair	2/15-6/15	2	3/1-2/28	2005
	Big Gulch River	NE	C	1.0	Migra-tion	Fair	11/1-2/15	N/A	Nonuse 2004-2007	2005
	Big Gulch	NE	N/A	0.0	N/A	N/A	N/A	N/A	3/1-2/28	2005
	Burned Out Canyon	NE	N/A	0.0	N/A	N/A	N/A	N/A	3/1-2/28	2005
	North Guyton	NE	N/A	0.0	N/A	N/A	N/A	N/A	3/1-2/28	2005
	South Guyton	NE	N/A	0.0	N/A	N/A	N/A	N/A	3/1-2/28	2005
Eakin	Jackknife	LAA	B	2.0	Spawn/ Rearing	Poor	2/15-6/15	7	4/1-5/1	2007
	Rutledge	NE	N/A	0.0	N/A	N/A	N/A	N/A	3/1-2/28	2007
	Private	NE	N/A	0.0	N/A	N/A	N/A	N/A	3/1-2/28	2007
Sixmile	Sixmile	NLAA	B	1.0	N/A	N/A	N/A	N/A	12/1-5/1	2004
	Hay Creek	LAA	B	2.0	Spawn/ Rearing	Fair	2/15-6/15	5	12/1-5/1	2004
C.H. Hill	Northside	NE	N/A	0.0	N/A	N/A	N/A	N/A	6/1-7/15	2005
	South	NE	N/A	0.0	N/A	N/A	N/A	N/A	7/16-8/30	2005
	Bologna Creek	LAA	B	0.25	Spawn/ Rearing	Poor	2/15-6/15	8	4/1-5/31	2005

Allotment	Pasture	Effect	Rosgen Chann. Type	BLM Stream Miles	Hab. Use	Hab. Qual.	Spawn/ Incub. Dates	Rank[1]	Season of Use	S&G Rev.[2]
Elsie Martin	Elsie Martin	NLAA	B	1.0	N/A	N/A	N/A	N/A	5/1-10/15	2005
Pryor Farms	North	LAA	B	0.75	Spawn/ Rearing	Poor	2/15-6/15	9	4/1-11/4	2008
	South	NE	N/A	0.0	N/A	N/A	N/A	N/A	4/1-11/4	2008
Crown Rock	Crown Rock	NE	B	0.0	N/A	N/A	N/A	N/A	4/1-4/30	2003
	Bear Creek	LAA	B	2.0	Spawn/ Rearing	Good/ Poor	2/15-6/15	1	4/1-4/30	2003
	Willow Spring	NE	N/A	0.0	N/A	N/A	N/A	N/A	4/1-4/30	2003
West Bologna Creek	West Bologna	NLAA	B	0.25	Spawn/ Rearing	Fair	2/15-6/15	N/A	9/10-9/15	2008

[1]Rank is based on the quantity, quality, and concentration of MCR steelhead spawning habitat within the pasture.
[2]Refers to Standards for Rangeland Health and Guidelines for Livestock Managment for Public Lands Administered by the Bureau of Land Management in the States of Oregon and Washington (BLM 1997). Review consists of evaluating if allotments are meeting standards for uplands, riparian areas, ecological processes, water quality, and native, T&E, and locally important species. Management will be adjusted accordingly.

In the BA, the CORA determined that activities on 2 of the 9 livestock grazing allotments for the 2004-2008 grazing season may affect, but are not likely to adversely affect (NLAA) MCR steelhead. Rationale for these determinations made by the CORA are included in Table 2.

Table 2. Rationale for NLAA Determinations on CORA Grazing Allotments for 2004-2008 Grazing Seasons

Allotment Name	Watershed (5th Field HUC)	Rationale for NLAA Determination
Elsie Martin	Jackknife Canyon	No spawning habitat on CORA land. No perennial streams. Habitat indicators will be maintained.
West Bologna Creek	Bologna Creek	0.6 miles of marginal spawning and rearing habitat which is inaccessible to livestock due to rock walls and thick vegetation. Habitat indicators will be maintained.

NOAA Fisheries concurs with CORA's NLAA determination for the two allotments listed in Table 2, based on the rationale summarized in Table 2. This Opinion serves as NOAA Fisheries' concurrence on the CORA-determined NLAA allotments. These NLAA allotments are not analyzed in any further detail in this Opinion.

Seven range allotments (Belshe, C.H. Hill, Crown Rock, Eakin, Pine Creek, Pryor Farms, and Sixmile) were determined likely to adversely affect (LAA) MCR steelhead by the CORA. The grazing activities on these allotments are analyzed in detail in this Opinion.

1.2.2 Proposed Action Descriptions on LAA Allotments

With the implementation of the Strategy for Salmon in 1992, and PACFISH in 1994, many riparian areas in the John Day River (JDR) basin have management programs in place to protect and enhance their condition. On CORA, a concerted effort was begun in the early 1990s to rework grazing management strategies and institute science-based grazing systems to eliminate long-term habitat degradation and promote riparian recovery. Season of use changes and restrictions were instituted, based on scientific knowledge which deals with the phenology of key plant species to determine timing of grazing and lead to development of healthy riparian areas. Science-based grazing strategies to promote riparian vegetative growth have been completed for most allotments within the JDR basin. In general, this has meant a shift from season-long and hot season grazing to early spring grazing strategies. Five of the seven allotments covered in this Opinion use spring grazing strategies, and two use season-long strategies. The spring grazing allotments are Belshe, C.H. Hill, Crown Rock, Eakin, and Sixmile, and the season-long allotments are Pine Creek and Pryor Farms.

1.2.2.1 Belshe Allotment

The Belshe Allotment (2509) incorporates a spring grazing strategy. It contains 1,610 acres of BLM land and 1,100 acres of private land. Perennial stream (mainstem JDR) length in this allotment is 1.5 miles and intermittent stream (Little Ferry Canyon) length is 1.25 miles on or beside BLM land. Little Ferry Canyon enters the JDR near RM 55. The mainstem JDR serves as a migration route for MCR steelhead, while Little Ferry Canyon provides spawning and rearing habitat. Little Ferry Pasture contains the only spawning and rearing habitat in the allotment.

The allotment contains 1,610 acres of public land which provides 58 Animal Unit Months (AUMs) of grazing forage for livestock. The operation runs between 50 and 100 head in the allotment. Cattle are fed hay until March 1 and then released on the allotment in the Little Ferry Pasture. In May the cattle are moved to Dan’s pasture and the other private pastures associated with the allotment.

The allotment contains four pastures: Little Ferry, Dan’s, Homestead, and 80. The Little Ferry and Dan’s pastures are on CORA land, while the Homestead and 80 pastures are on private land. The season of use is March 1 to May 1 for the Little Ferry Canyon, and March 1 to July 15 for the Dan’s Pasture.

Monitoring consists of unauthorized use monitoring, and taking photographs of riparian areas upstream and downstream every 0.25-miles from Little Ferry Canyon.

1.2.2.2 C.H. Hill Allotment

The C.H. Hill Allotment (2554) contains 1,835 acres of BLM land and 1,040 acres of private land. Perennial stream (mainstem JDR and Bologna Creek) length in this allotment is 0.75 miles and intermittent stream length is 2.6 miles on or beside BLM lands. Bologna Creek enters the JDR near RM 182. The mainstem JDR is migratory habitat only, while MCR steelhead may spawn and rear in 0.25 miles of Bologna Creek.

Grazing on BLM lands in this allotment is authorized between April 1 and May 31, for a preferred total of 86 AUMs. The allotment has four pastures: Northside, South, East, and Bologna Creek. Only the Bologna Creek Pasture provides MCR steelhead spawning and rearing habitat.

Monitoring consists of unauthorized use monitoring, and taking photographs of riparian areas upstream and downstream every 0.25-miles from Bologna Creek.

1.2.2.3 Crown Rock Allotment

On January 9, 2004, NOAA Fisheries received the end-of-year monitoring report for grazing in 2003, as an attachment to the 2004 BA, as ageed to by the Level 1 Team. The report provided 2003 riparian photo documentation of considerably improved, since 1990, riparian conditions associated with MCR steelhead habitat on Bear Creek within the Crown Rock Allotment. The allotment utilizes a spring grazing strategy. The photos showed that Bear Creek has narrowed and deepened with well-vegetated and stable streambanks, and increased densities of woody vegetation.

The Crown Rock Allotment is in the Bridge Creek watershed and includes portions of Bear Creek within its boundary. The allotment contains 1,085 public acres, with 56 AUMs associated. The season of use is between April 1 and December 15. Grazing on the allotment is done in early spring, April 15 to May 1 or May 2 to May 30, and fall/winter, October 15 to December 15. The Bear Creek Pasture was not grazed between 1999 and 2003. In 2004, the riparian pasture will be included in the grazing system and will be grazed within the season of use established. The allotment contains approximately 2 miles of Bear Creek within the Bear Creek Pasture, which provides spawning and rearing habitat to steelhead for approximately 1 mile, and migratory habitat for approximately 1 mile. The allotment contains three pastures: Crown Rock, Willow Spring (both upland pastures), and Bear Creek (riparian pasture).

Monitoring consists of unauthorized use monitoring, and taking photographs of riparian areas upstream and downstream every 0.25-miles from Bear Creek.

1.2.2.4 Eakin Allotment

The Eakin Allotment (2541) contains 1,760 acres of BLM land and no private land. The allotment contains no perennial streams, and 2 miles of intermittent streams (Jackknife Canyon) on or beside BLM land. Jackknife Canyon enters the JDR at RM 61.4. MCR steelhead may spawn in the intermittent streams during abundant water years.

Grazing on this allotment is authorized between April 1 and June 30, for a preferred total of 12 AUMs. The allotment contains three pastures, and only the Jackknife Pasture contains MCR steelhead habitat in intermittent streams.

Monitoring consists of unauthorized use monitoring, and taking photographs of riparian areas upstream and downstream every 0.25-miles from Jackknife Canyon.

1.2.2.5 Pine Creek Allotment

NOAA Fisheries is concerned about the three pastures containing MCR steelhead habitat that are grazed season-long. These pastures are the Porter Canyon, Cramer Canyon, and Bath Canyon Pastures. Monitoring of utilization standards used as triggers to move cattle or prevent cattle access from riparian areas has not been implemented in these pastures, and riparian recovery in the North Pasture is inhibited. Riparian condition associated with the Pine Creek Allotment will be monitored in 2004. The MCR steelhead spawning and rearing habitat on CORA land in the LJDR is essential to the survival and recovery of this species. Damage to streams and riparian areas caused by improper livestock grazing could slow or prevent recovery of riparian resources in this area.

The Pine Creek Allotment (2518) is in the LJDR subbasin and contains 5,418 acres of public land with an active preference of 346 AUMs. Grazing is authorized year-round.

The allotment contains four miles of interrupted perennial stream on public lands. These stream miles are associated with Pine Hollow and Long Hollow Creeks. Pine Hollow Creek enters the JDR near RM 85. The lower stretches of Pine Hollow serve as a migration corridor for MCR steelhead, reaches further upstream and in Long Hollow provide spawning and rearing habitat.

The allotment contains 10 pastures: Big Gulch, Big Gulch River, Zigzag, North Pole, Burned Out Canyon, North Guyton, Porter Canyon, South Guyton, Cramer Canyon, and Bath Canyon.

Only Big Gulch, Zigzag, Porter Canyon, Cramer Canyon, and Bath Canyon pastures contain MCR steelhead habitat. Of these, Zigzag provides only migratory habitat since this area of stream only flows during peak events. Big Gulch pasture provides mainstem migratory habitat. The stream in the other pastures dries up as well, however, there is a noted presence of residual pools that provide habitat for rearing steelhead.

According to definitions provided in Appendix E of the 2000 Grazing Implementation Monitoring Module, the BLM lands in Cramer Canyon Pasture and Porter Canyon Pasture are considered as Group 4 "scattered tracts."

Monitoring consists of unauthorized use monitoring, taking photographs of riparian areas upstream and downstream every 0.25-miles from Pine Hollow and Long Hollow Creeks, and monitoring of utilization standards to be determined by Level 1 Team in Porter Canyon, Cramer Canyon, and Bath Canyon Pastures during a June 2004, site visit.

1.2.2.6 Pryor Farms and Sixmile Allotments

On May 28, 2003, NOAA Fisheries and CORA visited pastures within the Sixmile and Pryor Farms Allotments. Hay Creek flows through the Hay Creek Pasture of the Sixmile Allotment and the North Pasture of the Pryor Farms Allotment, and provides spawning and rearing habitat for MCR steelhead. The Hay Creek Pasture is grazed in the spring and the North Pasture is grazed season-long. Hay Creek riparian condition was good in the Hay Creek Pasture. Streambanks were stable, with riparian vegetation consisting of abundant grasses, rushes, and an occasional sedge. Dying sagebrush adjacent to the stream indicated that sagebrush was being choked out and replaced by riparian vegetation. Riparian condition was also good along Hay Creek in the North Pasture. Streambanks were stable, but riparian vegetation was not as vigorous as in the Hay Creek Pasture due to the current grazing. Six trespass cows were observed in the Sixmile Pasture of the Sixmile Allotment.

The 2003 monitoring report noted some unauthorized use in the Sixmile and Pryor Farms Allotments. The report provided 2003 riparian photo documentation of considerably improved, since 1990, riparian conditions associated with MCR steelhead habitat on Hay Creek within the Sixmile Allotment. The Sixmile Allotment utilizes a spring grazing strategy. The photos showed that Hay Creek has narrowed and deepened, with well-vegetated and stable streambanks. However, the report also provided photo documentation showing that season-long use within the Pryor Farms Allotment is slowing riparian recovery considerably along Hay Creek within the North Pasture.

NOAA Fisheries is concerned about the North Pasture that is grazed season-long and contains MCR steelhead habitat. Monitoring of utilization standards used as triggers to move cattle or prevent cattle access from riparian areas has not been implemented in this pasture, and riparian recovery in the North Pasture is inhibited. The MCR steelhead spawning and rearing habitat on CORA land in the LJDR is essential to the survival and recovery of this species. Damage to streams and riparian areas caused by improper livestock grazing could slow or prevent recovery of riparian resources in these areas.

The Pryor Farms Allotment (2607) contains 800 acres of BLM land and an estimated 4,480 acres of private land. There is a total of 0.50 miles of Hay Creek and no intermittent streams on or beside BLM land. Hay Creek provides spawning and rearing habitat for MCR steelhead. Cattle grazing is authorized from April 1 to November 4, for a preferred total of 50 AUMs, but occurs only during the summer (June through August). There are two pasture units in this allotment; the North Pasture contains MCR steelhead spawning and rearing habitat in Hay Creek. According to definitions provided in Appendix E of the "2000 Grazing Implementation Monitoring Module," the South Pasture is considered a Group 4 "scattered tract." There is one vegetative trend study plot in this allotment.

Monitoring consists of unauthorized use monitoring, taking photographs of riparian areas upstream and downstream every 0.25-miles from Pine Hollow and Long Hollow Creeks, monitoring of 4-inch riparian stubble height utilization standard on Hay Creek in the North Pasture, and a vegetative trend study plot.

The Sixmile Allotment (2547) contains 2,397 acres of BLM land and 2,722 acres of private land. There are no perennial streams and a total of 3 miles of intermittent streams (Hay and Sixmile Creeks) on or beside BLM lands in this allotment. Hay Creek enters the JDR near RM 30. MCR steelhead spawning and rearing has been documented in Hay Creek and is suspected in Sixmile Creek.

Grazing on BLM lands in this allotment is authorized between December 1 and May 1, for a preferred total of 245 AUMs. There are three pasture units in this allotment; the Hay Creek and Sixmile Creek pastures contain MCR steelhead habitat and each are grazed every other year. According to definitions provided in Appendix E of the "2000 Grazing Implementation Monitoring Module," BLM lands in the Upper Pasture are considered as Group 4 "scattered tracts." The Upper Pasture does not contain MCR steelhead habitat. There are two vegetative trend study areas and 11 photopoints on this allotment.

The allotment contains 2,394 public acres of land with 245 AUMs alloted and approximately 2,722 acres of private land. The lessee runs an operation of approximately 120 cattle from December through May.

Monitoring consists of unauthorized use monitoring, and taking photographs of riparian areas upstream and downstream every 0.25-miles from Hay Creek.

1.2.3 Prescribed Burning

The BLM is proposing to continue with the prescribed burn program to burn approximately 15,000 acres annually within the John Day Basin, to simulate the natural process of vegetative succession. Modern fire suppression and recent fire management plans have greatly altered the natural fire regimes, and have changed vegetative species composition, diversity, and ecosystem structure of most of the Northwest. The majority of burns are rangeland sites in late or mid-seral stage. The targeted vegetation for burning is mainly overstory big sagebrush (*Artemisia tridentata*) and western juniper (*Juniperus occidentalis*). Long-term goals of the program are to: (1) Restore health and diversity of vegetation; (2) control spread of western juniper; (3) reduce hazard fuels; (4) improve decadent aspen (*Populus tremuloides*) communities; (5) improve long-term hydrological regimes (water quality, flow, and timing); and (6) increase forage for wildlife and livestock.

Prescribed burning is the planned application of fire to wildland fuels in their natural or modified state, under specific conditions of fuel, weather, and other variables, to allow fire to achieve site-specific resource management objectives. All burn units proposed for treatment will be evaluated for special resource needs and mitigating measures would be covered in the burn plan to ensure project objectives can be met, or the unit will be dropped from consideration. Mitigation measures used to develop burn plans include: (1) Burning primarily in late summer or fall when most vegetation is dormant; (2) mimicing natural historic fire regime by burning in a mosaic pattern; (3) using existing roads, trails, or natural fuel breaks to contain fire; and (4) not allowing prescribed fire to enter riparian zones along perennial or fish-bearing streams.

Treatments will primarily occur on sagebrush-juniper plant associations, but may include ponderosa pine (*Pinus ponderosa*), aspen, or riparian sites beside ponds, wetlands, or intermittent non-fish-bearing streams. Prescription burn temperatures should not exceed 500˚F. Following treatment, units will be monitored to determine the project's effectiveness, fire effects, and recovery rates using photo-point references, plots, and individual observations. Firing methods will be specific to each proposed unit, and could include combinations of hand-held drip torches, heli-torches, ping-pong balls, and fuzees. In the event that a unit is selected without existing firelines present, fireline would be constructed from a combination of roads, handline, and blackline in an efficient manner that protects natural resources. All roads/line constructed will be rehabilitated using waterbars, and native seed mixes following completion of the burn. Table 3 displays proposed burn areas for 2004.

Table 3. Proposed Prescribed Burn Units for Fiscal Year 2004 in the John Day Basin

Name	Location	Acres to Burn
Sutton Mountain	Sutton Mountain/Mitchell	10,000 acres

CORA determined in the BA that the 2004-2008 prescribed burning program is NLAA. NOAA Fisheries concurs with this NLAA determination for the following reasons: (1) Fire will be prevented from entering riparian areas; and (2) MCR steelhead habitat indicators will be maintained.

2. ENDANGERED SPECIES ACT

2.1 Biological Opinion

2.1.1 Biological Information

The MCR steelhead evolutionarily significant unit (ESU) was listed as threatened under the ESA by NOAA Fisheries on March 25, 1999 (64 FR 14517). Protective regulations for MCR steelhead were issued under section 4(d) of the ESA on July 10, 2000 (65 FR 42422). Biological information concerning the MCR steelhead is found in Busby *et al.* (1996).

The major drainages in the MCR steelhead ESU are the Deschutes, John Day, Klickitat, Umatilla, Walla Walla, and Yakima river systems. NOAA Fisheries (2003) has indicated that the 5-year average (geometric mean) abundance of natural MCR steelhead was up from previous years basin estimates in the ESU. The Klickitat, Yakima, Touchet, and Umatilla systems are all well below their interim abundance targets (Table 3). The John Day and Deschutes are at or above their interim targets for abundance, however, there is significant concern regarding the straying of fish into the Deschutes system from other ESUs. The productivity estimate (λ) of the MCR ESU is approximately 0.98, indicating that the productivity of MCR steelhead is slightly below its target of 1.0. The NOAA Fisheries biological review team (BRT) has determined that the MCR ESU is likely to become endangered because of stock abundance and long-term productivity being depressed within the ESU.

Table 4. Interim Abundance Targets for the MCR Steelhead ESU (adapted from NOAA Fisheries 2003)

ESU/Spawning Aggregations*	Interim Abundance Targets	Interim Productivity Objective
Walla-Walla	2,600	Middle Columbia ESU populations are currently well below recovery levels. The geometric mean Natural Replacement Rate (NRR) will therefore need to be greater than 1.0
Umatilla	2,300	
Deschutes (Below Pelton Dam Complex)	6,300	
John Day		
North Fork	2,700	
Middle Fork	1,300	
South Fork	600	
Lower John Day	**3,200**	
Upper John Day	2,000	

*Population in bold is addressed in this Opinion

The JDR is the largest river system in the range of MCR steelhead that is free of dams. There is no artificial propagation of steelhead in the system, and runs are driven almost exclusively by native stocks, making the JDR system unique within the ESU. However, there is some straying of hatchery fish into the JDR system from the Columbia River (Unterwegner and Gray 1997). The Oregon Department of Fish and Wildlife (ODFW) estimates yearly returns of adult steelhead to the JDR basin from 3,900 to 36,400, with estimated escapement averaging 13,988 adults since 1987. NOAA Fisheries (2003) states that while the JDR system has met or exceeded interim abundance targets for the last 5 years, the long-term trend for abundance is still downward.

The JDR and its tributaries provide spawning, rearing, and migratory habitat for both adult and juvenile life stages of MCR steelhead. The LJDR provides migratory habitat only for MCR steelhead. In 2002, redd abundance in the JDR basin was at its highest levels since listing. Adult MCR steelhead enter the Columbia River beginning in the spring and migrate upriver through the summer, fall, and winter, seeking their tributary of origin. By early the following spring, the adults have reached their natal streams and spawn in gravel redds/nests from March to early June. Deposited eggs usually hatch by the July of the same year. The resulting juveniles will spend from one to four years rearing to smolt size, at which time they will begin their migration to the ocean.

Key habitat components of the adult spawning, juvenile rearing, and adult and migratory habitat for this species are: Substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food (juvenile only), riparian vegetation, space, and safe passage conditions (Bjornn and Reiser 1991; NOAA Fisheries 1996b; Spence *et al.* 1996). The key habitat components that the proposed project may affect are: Substrate, water quality, water temperature, water velocity, cover/shelter, food, and riparian vegetation.

2.1.2 Evaluating Proposed Actions

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402 (the consultation regulations). In conducting analyses of habitat-altering actions under section 7 of the ESA, NOAA Fisheries uses the following steps: (1) Consider the status and biological requirements of the species; (2) evaluate the relevance of the environmental baseline in the action area to the species' current status; (3) determine the effects of the proposed or continuing action on the species; (4) consider cumulative effects; and (5) determine whether the proposed action, in light of the above factors, is likely to appreciably reduce the likelihood of species survival in the wild. In completing this step of the analysis, NOAA Fisheries determines whether the action under consultation, together with all cumulative effects when added to the environmental baseline, is likely to jeopardize the continued existence of the ESA-listed species.

2.1.3 Biological Requirements

The first step the NOAA Fisheries uses when applying the ESA section 7(a)(2) to listed steelhead is to define the species' biological requirements that are most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list MCR steelhead for ESA protection and also considers new data available that is relevant to the determination.

For this consultation, the relevant biological requirements are improved habitat characteristics that support successful adult and juvenile migration, spawning and rearing. MCR steelhead survival in the wild depends on the proper functioning of certain ecosystem processes, including habitat formation and maintenance. Restoring functional habitats depends largely on allowing natural ecological processes to proceed, while removing adverse impacts of current practices. The current status of the MCR steelhead, based on their risk of extinction, has not significantly improved since the species was listed.

2.1.4 Environmental Baseline

The environmental baseline is an analysis of the effects of past, present, human-related and natural factors leading to the current status of the species or its habitat and ecosystem within the action area. The action area is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR 402.02).

The action area for this consultation, includes: (1) Little Ferry Canyon and the LJDR and their tributaries within or beside the CORA-administered portions of the Belshe Allotment; (2) Bologna Creek and the LJDR and their tributaries within or beside the CORA-administered portions of the C.H. Hill Allotment; (3) Bear Creek and its tributaries within or beside the CORA-administered portions of the Crown Rock Allotment; (4) Jackknife Canyon and its tributaries within or beside the CORA-administered portions of the Eakin Allotment; (5) Pine Hollow Creek and the LJDR and their tributaries within or beside the CORA-administered portions of the Pine Creek Allotment; (6) Hay Creek and its tributaries within or beside the CORA-administered portions of the Pryor Farms Allotment; and (7) Hay Creek and its tributaries within or beside the CORA-administered portions of the Sixmile Allotment. These streams contain spawning, rearing, and/or migratory habitat for MCR steelhead.

The LJDR subbasin encompasses 2,011,000 acres from the NFJD River confluence at RM 185 near Kimberly, Oregon, downstream to its confluence with the Columbia River. The CORA administers 242,618 acres (12.1%) in the LJDR subbasin. Major tributaries within the subbasin include Rock Creek, Thirtymile Creek, Butte Creek, Pine Hollow Creek, Bridge Creek, Kahler Creek, and Parrish Creek. The CORA-administered portions of the 7 livestock grazing allotments addressed in this Opinion comprise a total of approximately 14,905 acres (0.74%) of the land in the LJDR subbasin.

Environmental baseline conditions within the action area were evaluated for the subject actions at the watershed scale. Perennial and intermittent streams were evaluated separately. The results of this evaluation, based on the "matrix of pathways and indicators" (MPI) described in *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the*

Watershed Scale (NOAA Fisheries 1996), follow. This method assesses the current condition of instream, riparian, and watershed factors that collectively provide properly functioning aquatic habitat essential for the survival and recovery of the species.

In the LJDR subbasin, four of the 18 habitat indicators in the MPI for perennial streams were rated as "properly functioning." These are: Chemical contaminants/nutrients, physical barriers, increase in drainage network, and disturbance history. Eight of the 18 habitat indicators in the MPI for perennial streams were rated as "functioning at risk." These are: Substrate, pool quality, off-channel habitat, refugia, width/depth ratio, floodplain connectivity, change in peak/base flow, and road density and location. Five of the 18 for perennial streams were rated as "not properly functioning." These are: Temperature, sediment, large wood, pool frequency, and streambank condition. Riparian reserves were not rated because a riparian potential assessment has not been completed, but it was noted that riparian quality and connectivity is improving. The environmental baseline conditions for each habitat indicator in the MPI are described in the BA, and incorporated into this Opinion by reference. This method assesses the current condition of instream, riparian, and watershed factors that collectively provide properly functioning aquatic habitat essential for the survival and recovery of the species. An assessment of the key habitat components of MCR steelhead habitat are obtained by using the MPI process to evaluate whether aquatic habitat is properly functioning. Table 5 summarizes habitat ratings.

In the LJDR subbasin, six of the 18 habitat indicators in the MPI for intermittent streams were rated as "properly functioning." These are: Sediment, Chemical contaminants/nutrients, substrate, pool quality, streambank condition, increase in drainage network, and disturbance history. Four of the 18 habitat indicators in the MPI for intermittent streams were rated as "functioning at risk." These are: Physical barriers, floodplain connectivity, change in peak/base flow, and road density and location. Three of the 18 for intermittent streams were rated as "not properly functioning." These are: Temperature, pool frequency, and refugia. Four indicators were not rated including: Large wood, off-channel habitat, width/depth ratio, and riparian reserves. Large wood was not rated, because it does not appear to have played a significant role naturally in these streams. Off-channel habitat was not rated, because off-channels play an insignificant role in these channels. Width/depth ratio was not rated, because of the lack of wetted stream during rearing periods. Riparian reserves were not rated because a riparian potential assessment has not been completed. The environmental baseline conditions for each habitat indicator in the MPI are described in the BA, and incorporated into this Opinion by reference. This method assesses the current condition of instream, riparian, and watershed factors that collectively provide properly functioning aquatic habitat essential for the survival and recovery of the species. An assessment of the key habitat components of MCR steelhead habitat are obtained by using the MPI process to evaluate whether aquatic habitat is properly functioning. Table 5 summarizes habitat ratings.

Table 5. Summary of LJDR Subbasin Conditions in the Action Area

MPI Pathways	MPI Indicators[1]	Streams	
		Perennial	**Intermittent**
Water Quality	Temperature	NPF	NPF
	Sediment	NPF	PF
	Chemical Contaminants/ Nutrients	PF	PF
Access	Physical barriers	PF	FAR
Habitat Elements	Substrate Embeddedness	FAR	PF
	Large Woody Debris	NPF	NR
	Pool Frequency	NPF	NPF
	Pool Quality	FAR	PF
	Off Channel Habitat	FAR	NR
	Refugia	FAR	NPF
Channel Conditions & Dynamics	Width/depth ratios	FAR	NR
	Streambank Condition	NPF	PF
	Floodplain Connectivity	FAR	FAR
Flow/ Hydrology	Change in Peak Base Flows	FAR	FAR
	Increase in Drainage Network	PF	PF
Watershed Condition	Road Density and Location	FAR	FAR
	Disturbance History	PF	PF
	Riparian Reserves	NR	NR

[1] The condition of each MPI parameter is indicated in the following manner: PF= properly functioning, FAR= functioning at risk, NPF= not properly functioning, NR=not rated/data unavailable

2.1.4.1 Allotment-Specific Conditions

Belshe Allotment
This allotment contains or is beside 1.5 miles of the JDR which provides migratory habitat for MCR steelhead, and 1.25 miles of Little Ferry Canyon, an intermittent stream providing 0.8 miles of spawning and rearing habitat for MCR steelhead. Little Ferry Canyon enters the JDR at RM 55. Little Ferry Canyon flows during runoff periods and dries up in sections along the upper and lower end of the Little Ferry Pasture. The portion of the stream in Dan's Pasture dries up early in the season and does not provide summer habitat for steelhead.

During the 2003 grazing season, there was no unauthorized use, and a riparian photo plot was re-measured.

C.H. Hill Allotment
This allotment contains or is beside the JDR which provides migratory habitat for MCR steelhead, and Bologna Creek, a perennial stream providing 0.25 miles of steelhead spawning and rearing habitat. Bologna Creek enters the JDR near RM 182. Only the Bologna Creek Pasture provides steelhead spawning and rearing habitat. This allotment was not monitored in 2003.

Crown Rock Allotment
This allotment contains 2 miles of Bear Creek, a perennial stream providing 1 mile of MCR steelhead migratory habitat and 1 mile of steelhead spawning and rearing habitat. The only pasture containing MCR steelhead habitat is the Bear Creek riparian pasture. Monitoring in this allotment consists of upstream and downstream riparian photos taken every 0.25 mile. Photos were taken in 1987, 1992, and 2003. The 2003 photos show vastly improved riparian conditions relative to the 1987 and 1992 photos. Hardwood vegetation was largely absent or very sparse in 1987 and 1992, but the 2003 photos show dense and tall hardwood vegetation resulting in excellent stream shade and bank stability.

Eakin Allotment
This allotment contains no perennial streams, but contains 2 miles of Jackknife Canyon which is an intermittent stream that provides spawning habitat during abundant water years. The Jackknife Pasture is the only pasture containing MCR steelhead habitat. Riparian photos taken upstream and downstream every 0.25 mile in 1980 and 1990, showed improvement in riparian vegetative condition from 1980 to 1990 including an increase in woody vegetation. Because of the limited fishery potential there is no recent riparian monitoring information available.

Pine Creek Allotment
There are 4 miles of interrupted perennial stream on public lands within the allotment associated with Pine Hollow and Long Hollow creeks. Long Hollow Creek is a tributary to Pine Hollow Creek, and Pine Hollow Creek enters the JDR near RM 85. The lower portion of Pine Hollow Creek serves as a migration corridor for MCR steelhead, while upper Pine Hollow Creek and Long Hollow Creek provide spawning and rearing habitat. Big Gulch, Zigzag, Porter Canyon,

Cramer Canyon, and Bath Canyon pastures contain MCR steelhead habitat. Big Gulch and Zigzag pastures only provide migratory habitat. Porter Canyon, Cramer Canyon, and Bath Canyon contain intermittent streams with residual pools during the summer that provide habitat for rearing steelhead. In 2003, there was no unauthorized use in this allotment.

Pryor Farms Allotment
This allotment contains 0.50 miles of Hay Creek, a perennial stream providing spawning and rearing habitat for MCR steelhead, and no intermittent streams. Of the two pastures in the allotment, only the North Pasture contains MCR steelhead habitat.

In 2003, there was unauthorized use in the allotment, and a vegetative trend study plot was established. Upstream and downstream riparian photos were taken every 0.25 mile in 1980, 1990 (6/1990), and 2003 (9/2003). The photos show some improvement of riparian condition from 1990 to 2003, but season-long grazing is limiting the development of riparian vegetation. The stream channel appeared to narrow and some riparian vegetation became established between 1990 and 2003, however vegetation was very short. Willow is also starting to become established along the stream. Recovery appears to be occurring, but at a much slower rate than areas with spring grazing or no grazing. NOAA Fisheries and BLM visited the North Pasture on May 28, 2003, and riparian vegetation was not overgrazed after cattle being present since April 1, 2003, but based on the photos from September 20, 2003, cattle should have been moved soon after May 28. The streambanks of Hay Creek are fairly stable because they contain a prominent cobble component.

Sixmile Allotment
This allotment contains a total of 3 miles of intermittent streams (Hay Creek and Sixmile Creek) and no perennial streams on or beside BLM land. Hay Creek is known to provide MCR steelhead spawning and rearing habitat and Sixmile Creek is suspected to provide steelhead spawning and rearing habitat. Hay Creek enters the JDR near RM 30. The Hay Creek and Sixmile Creek pastures contain MCR steelhead habitat.

In 2003, there was unauthorized use in the allotment. Upstream and downstream riparian photos were taken every 0.25 mile on Hay Creek in the Hay Creek Pasture in 1980, 1990 (6/1990), and 2003 (9/2003). The photos show drastic improvement in riparian condition from 1990 to 2003. The stream channel has narrowed and deepened considerably, has stable, well-vegetated streambanks, and sagebrush is being replaced in places by rushes and cattails. NOAA Fisheries and BLM visited the Hay Creek Pasture on May 28, 2003, and riparian vegetation was in excellent condition and was not overgrazed.

2.1.5 Analysis of Effects

The effects determination in this Opinion was made using a method for evaluating current aquatic conditions, the environmental baseline, and predicting effects of actions on them. The effects of actions are expressed in terms of the expected effect (restore, maintain, or degrade) on aquatic habitat elements and indicators in the action area.

Impacts of livestock grazing to stream habitat and fish populations can be separated into direct and indirect effects. Direct effects are those which contribute to the immediate loss or harm to individual fish or embryos (*e.g*., stepping on a fish, trampling a redd that results in the actual destruction of embryos, dislodging the embryos from the protective nest and ultimately destroying eggs). Direct effects are of greatest concern in allotments incorporating spring grazing. Indirect effects are those impacts which occur at a later time, causing loss of specific habitat features (*e.g*., undercut banks, sedimentation of spawning beds), localized reductions in habitat quality (*e.g.*, sedimentation, loss of riparian vegetation, changes in channel stability and structure), and, ultimately, cause loss or reductions of entire populations of fish, or widespread reductions in habitat quantity and/or quality.

Based on plant phenology, the only grazing strategies considered to have a good chance of rehabilitating degraded streams and riparian areas are light or tightly controlled uses such as winter-only grazing or riparian pastures with short, early-spring use periods (Platts 1991). Studies (Leonard *et al.* 1997, Ehrhart and Hanson 1997, and Kinch 1989) have shown that cattle are less likely to concentrate on riparian areas during spring months because of flooding and because water and herbaceous vegetation is readily available in upland areas away from streams. Myers (1989) concluded that good or excellent riparian conditions were maintained by grazing systems that exclude livestock use during the hot season, and recommended grazing not be allowed during the hot summer months more than once every four years. Similarly, Clary and Webster (1989) stated grazing should be avoided during mid and late summer and recommend early grazing, followed by complete removal of livestock. Early grazing allows significant herbaceous regrowth to occur in riparian areas, reducing most grazing damage before higher flows occur the following spring or summer, and avoids impacts to woody plant species when livestock forage preference shifts occur.

<u>Direct Effects to MCR Steelhead</u>

Direct effects of livestock grazing may occur when livestock enter the streams occupied by MCR steelhead to loaf, drink, or cross the stream. During the early phases of their life cycle, MCR steelhead have little or no capacity for mobility, and large numbers of embryos or young are concentrated in small areas. Livestock entering fish-spawning areas can trample redds, and destroy or dislodge embryos and alevins. Belsky *et al.* (1997) provide a review of these direct influences on stream and riparian areas. Wading in streams by livestock can injure or kill eggs and pre-emergent fry at least equal to that demonstrated for human wading (Roberts and White 1992). In this investigation, a single wading incident on a simulated spawning bed induced 43% mortality of pre-hatching embryos. In a recent (July 12, 2000) occurrence of unauthorized livestock grazing in the Sullens Allotment on the Malheur National Forest, five out of five documented MCR steelhead redds in a meadow area of a Rosgen C-type stream channel in Squaw Creek (Middle Fork JDR subbasin) were trampled by cattle (FS memorandum, August 17, 2000).

Avoidance of direct impacts to MCR steelhead spawning areas can be achieved by scheduling grazing in pastures containing spawning habitat to occur after July 15, or by excluding known spawning areas from livestock access. The ODFW guidelines for the timing of in-water work in the JDR basin, which are designed to protect salmonid species, do not allow in-water work in any stream in the basin before July 15. The period during which spawning MCR steelhead adults may be susceptible to harassment, or eggs and pre-emergent fry susceptible to trampling by livestock, is from March 15 to July 15 in the JDR basin streams. In some allotments or pastures, there are pre-existing natural topographic, geologic, and vegetative features, or high spring water flows that naturally exclude or minimize livestock use from spawning areas. Other forms of direct take (*i.e.*, harassment of MCR steelhead by livestock when livestock enter or are beside occupied habitat, resulting in MCR steelhead behavioral modifications) are more difficult to address in the context of an economically viable grazing program. Direct take in the form of harassment can be reduced in the long term by rangeland management that results in better riparian and in-channel habitat conditions, and create more cover and other important habitat features conducive to MCR steelhead survival and recovery.

Cattle wading into a stream to loaf, drink, or cross the stream have the potential to frighten juvenile MCR steelhead from streamside cover. Once these juveniles are frightened from cover and swim into open water, they become more susceptible to predation. However, NOAA Fisheries believes that the risk of mortality of juvenile salmonids due to flushing from cover by watering cattle is minimal.

<u>Direct and Indirect Effects to MCR Steelhead Habitat</u>
The following habitat effects are most relevant for season-long grazing associated with the Pine Creek and Pryor Farms Allotments. However, it is important to monitor riparian condition in spring grazing allotments to ensure that riparian habitat conditions are not being degraded.

Numerous symposia and publications have documented the detrimental effects of livestock grazing on stream and riparian habitats (Johnson *et al.* 1985; Menke 1977; Meehan and Platts 1978; Cope 1979; American Fisheries Society 1980; Platts 1981; Peek and Dalke 1982; Ohmart and Anderson 1982; Kauffman and Krueger 1984; Clary and Webster 1989; Gresswell *et al.* 1989; Kinch 1989; Chaney *et al.* 1990, Belsky *et al.* 1997). These publications describe a series of synergistic effects that can occur when cattle over-graze or impact riparian areas: (1) Woody and hydric herbaceous vegetation along a stream can be reduced or eliminated; (2) streambanks can collapse due to livestock trampling; (3) without vegetation to slow water velocities, hold the soil, and retain moisture, flooding can cause erosion of streambanks; (4) the stream can become wider and shallower, and in some cases downcut; (5) the water table can drop; and (6) hydric, deeply rooted herbaceous vegetation can die out and be replaced by upland species with shallower roots and less ability to bind the soil. The resulting instability in water volume, increased summer water temperature, loss of pools and habitat adjacent and connected to streambanks, and increased substrate fine sediment and cobble-embeddedness adversely affect MCR steelhead and their habitat. Specific effects to MCR steelhead habitat elements are described below.

<u>Riparian Vegetation and Shade</u>
In areas under historic season-long grazing, major vegetation changes have taken place with changes in livestock use. Routinely grazing an area too late in the growing season causes

adverse changes in the plant community. Individual plants are eliminated by re-grazing them during the growing season and not allowing adequate recovery after grazing. Regardless of seral stage, at least 6 inches of residual stubble or regrowth is recommended to meet the requirements of plant vigor maintenance, bank protection, and sediment entrapment (Clary and Webster 1989). More than 6 inches of stubble height may be required for protection of critical fisheries or easily eroded streambanks and riparian ecosystem functions (Clary and Webster 1989). In the Blue Mountains of eastern Oregon, regrowth of herbaceous vegetation does not normally occur after July (Gillen *et al.* 1985). Consequently, livestock use of riparian vegetation in the summer and fall needs to be tightly controlled to ensure adequate stubble height to protect streambanks during high streamflows in winter and spring.

Over time, entire plant communities can change as a result of heavy or prolonged grazing pressure. In mountain riparian systems of the Pacific Northwest, the replacement of native bunch grass with Kentucky bluegrass has occurred in many areas. Kentucky bluegrass has established itself as a dominant species in native bunch grass meadows as a result of overgrazing and subsequent habitat deterioration. Plants in the early seral stage community do not provide as much protection for the watershed and streambanks. Many forbs and annual plants that frequently dominate early seral plant communities do not have the strong deep root systems of the later seral perennials such as bunch grasses, sedges, rushes, shrubs, and willows.

The riparian areas in the JDR Basin are particularly sensitive to overgrazing by exotic ungulates because the native vegetation of the grasslands west of the Rocky Mountains evolved in the absence of large herbivores for the past 2,500 years (Mack and Thompson 1982 *cited in* Li *et al.* 1994). In contrast, grasses east of the Rocky Mountains evolved with the bison and exotic ungulate (cattle and sheep) impact on grass communities was not as severe (Li. *et al.* 1994).

Removal of riparian vegetation reduces habitat quality, resulting in negative impacts to fish production (Platts and Nelson 1989). Reduction in streambank cover related to overhanging vegetation, root vegetation, and undercut banks has been correlated to reduced fish production (EPA 1993). Effects are particularly evident in meadow systems, where herbaceous vegetation may provide the only shade to stream channels. Stream cover in hardwood-dominated riparian systems can also be damaged, in some situations, by livestock grazing. Shrubby vegetation, such as willows, may be an important source of shade along smaller streams and in mountainous areas (Henjum *et al*. 1994). Cattle often begin to browse woody species when herbaceous stubble heights fall below 10 cm, or approximately 4 inches (Hall and Bryant 1995). Others suggest that 10 to 20 cm, or approximately 6 to 8 inches, of herbaceous residual stubble height may be needed to protect hardwoods, especially during late season grazing (Clary and Leininger 2000).

In a study of late season grazing in the Blue Mountains of eastern Oregon, Kauffmann *et al.* (1983) found that shrub use was generally light except on willow-dominated gravel bars. They conclude that on gravel bars, succession was retarded by livestock grazing. Another study with similar results found that regeneration of some woody vegetation, such as willow, cottonwood, and aspen is inhibited by browsing on seedlings (Fleischner 1994).

In a study of watersheds in the JDR basin, Maloney *et al.* (1999) found that watersheds with less than 75% surface shade can exceed stream temperature standards for rainbow trout and chinook salmon. Stream temperatures in all heavily grazed watersheds in this study exceeded standards for salmonids. The authors concluded that revegetation of the streamside area with shrubs or small trees would likely result in reduced stream temperatures and an improved environment for rainbow trout and chinook salmon. They further suggest that maintaining the integrity of the riparian zone could be achieved by using buffer strips and more stringent control of animal usage in riparian areas.

Li (1994) noted that solar radiation reaching the channel of an unshaded stream in the JDR basin was six times greater than that reaching an adjacent, well-shaded stream, and that summer temperatures were 4.5 ºC warmer in the unshaded tributary. Below the confluence of these two streams, reaches that were unshaded were significantly warmer than shaded reaches both upstream and downstream. A separate comparison of water temperatures at two sites of similar elevation in watersheds of comparable size found temperature differences of 11ºC between shaded and unshaded streams (Li 1994). Warming of streams from loss of riparian vegetation is likely widespread in eastern Oregon, and may be particularly acute because of low summer flows and many cloudless days

Livestock indirectly affect plant species composition in riparian areas by aiding the dispersal and establishment of nonnative species, *i.e.* seeds may be carried on the fur or in the dung of livestock (Fleischner 1994). The presence of nonnative species, especially invasive and highly competitive weed species such as knapweeds and thistles, can disrupt the natural functions of riparian areas.

<u>Streambank Stability and Channel Morphology</u>

Removal of the streambank/riparian vegetation as well as mechanical bank damage reduces the structural stability of the stream channel with several negative impacts to fish productivity resulting (EPA 1993). Several studies have shown that heavy livestock grazing pressure causes significant streambank damage (Kaufman *et al.* 1983). Other studies indicate that light or moderate grazing pressure did not result in significant streambank damage (Buckhouse *et al.* 1981).

Riparian areas over-grazed by cattle often have reduced salmonid living space caused by increased stream channel widening and increased width/depth ratios (Platts and Nelson 1989, EPA 1993). When riparian areas are over-grazed, a synergistic adverse effect on streambank stability occurs. As stubble height of herbaceous vegetation along streambanks decreases, livestock eating this vegetation must move more frequently to achieve intake needs. Increased movement leads to trailing in riparian areas causing more compaction and bank damage (Clary and Lenninger 2000).

<u>Riparian Soils</u>

Livestock grazing also influences vegetation by modifying soil characteristics. Hooves compact soils that are damp or porous, which inhibits the germination of seeds and reduces root growth

(Heady and Child 1994). The degree of soil compaction depends on soil characteristics, including texture, structure, porosity, and moisture content (Platts 1991; Heady and Child 1994), and the movement of animals as directed by the permitee or rider. Generally, soils that are high in organic matter, porous, and composed of a wide range of particle sizes are more easily compacted than other soils. Similarly, moist soils are usually more susceptible to compaction than dry soils, although extremely wet soils may give way and then recover following compression by livestock (Clayton and Kennedy 1985).

Changes in soil infiltration capacity associated with soil compression due to livestock may lead to more rapid surface runoff, lowering moisture content of soil, and the ability of plants to germinate or persist (Heady and Child 1994). However, sometimes livestock may break up impervious surface soils, allowing for greater infiltration of water and helping to cover seeds (Savory 1988 *cited in* Heady and Child 1994). Soils in arid and semi-arid lands have a unique microbiotic surface layer or crust of symbiotic mosses, algae, and lichens that covers soil between and among plants. This "cryptogamic crust" plays an important role in hydrology and nutrient cycling and is believed to provide favorable conditions for the germination of vascular plants (Fleischner 1994). The hooves of livestock break up these fragile crusts, and reformation may take decades. Anderson *et al*. (1982) found recovery of cryptogamic crusts took up to 18 years in ungrazed enclosures in Utah. In arid and semi-arid climates, the cryptogamic crust has been shown to increase soil stability and water infiltration (Loope and Gifford 1972; Kleiner and Harper 1977; Rychert *et al*. 1978). Disruption of the cryptogamic crust may thus have long-lasting effects on erosional processes.

If improper management leads to overgrazing, livestock also indirectly alter surface soils by removing ground cover and mulch, and by soil compaction which in turn affects the response of soils to rainfall. Kinetic energy from falling raindrops erodes soil particles (splash erosion), which may then settle in the soil interstices resulting in a less-pervious surface. Livestock grazing can increase the percentage of exposed soil and break down organic litter, reducing its effectiveness in dissipating the energy of falling rain. However, livestock in open range conditions are not normally observed in concentrations sufficient to cause this type of effect.

Water Quality

Removal of riparian vegetation from grazing results in increased insolation reaching streams, leading to cumulative increases in downstream temperatures (Barton *et al.* 1985). This is especially true for high desert watersheds of the intermountain West, such as the JDR basin (Platts and Nelson 1989). Alteration of stream temperature processes may also result from changes in channel morphology. As mentioned above, the streams in areas that are improperly grazed are wider and shallower than in ungrazed systems, thus exposing a larger surface area to incoming solar radiation (Platts 1991). Reducing stream depth may expose the stream bottom to direct solar radiation, which may allow for greater heating of the substrate and subsequent conductive transfer to the water.

Bell (1986) reported the upper lethal temperature for steelhead to be 75.02° F with a preferred temperature range of 50 to 55° F. The ability of rearing MCR steelhead to tolerate temperature extremes to a certain degree depends on the fish's recent thermal history, however, research indicates that most salmonid species are at risk when temperatures exceed 73 to 77° F (Spence *et al.* 1996). In addition to the lethal effects of high temperatures, ectothermic salmonids rearing at temperatures near the upper lethal limit experience decreased growth because nearly all consumed food is used for metabolic maintenance (Bjornn and Reiser 1991). Temperatures exceeding the upper lethal limits may be tolerated for brief periods or fish may seek thermal refugia. Li *et al.* (1991) reported that resident rainbow trout in an eastern Oregon stream selected natural and artificially created coldwater areas when temperatures in the main stream channel exceeded 75.2° F, but showed no preference for these areas when temperatures in the main stream channel were less than 68° F. Coldwater refugia, such as springs and groundwater seeps, allow some MCR steelhead to persist in areas where temperatures in main stream channels exceed their upper lethal limit. However, total MCR steelhead production in stream reaches will decrease if the amount of habitat suitable for the species use decreases as temperatures increase and fish are restricted to coldwater refugia areas.

Increases in stream temperature due to removal of streamside vegetation will also have a negative effect on dissolved oxygen (DO) concentrations. As temperatures increase, oxygen solubility in water decreases and DO levels decrease. Salmonids require an approximate DO level of 6 mg/L to survive, and suffer no metabolic impairment when DO levels remain at 8 mg/L (Davis 1975). Phillips and Campbell (1961) determined that DO levels must average greater that 8mg/L for embryos and alevins to have good survival rates. Silver *et al*. (1963) and Shumway *et al*. (1964) observed that salmonids reared in water with low or intermediate oxygen levels were smaller in size and had a longer incubation period than those raised in high DO levels. Low DO levels increased the incubation periods for anadromous species, and decreased the size of alevins (Garside 1966; Doudoroff and Warren 1965; Alderdice *et al*. 1958).

Because riparian areas are favored by cattle, nutrients eaten elsewhere on the range are often deposited in riparian zones or near other attractors, such as salt blocks (Heady and Child 1994). The deposition of nutrients in riparian areas increases the likelihood that elements such as nitrogen and phosphorous will enter the stream. Nutrients derived from livestock wastes may be more bioavailable than those bound in organic litter.

Prey Base

The coldwater communities which rearing juvenile salmonids rely on require minimum DO levels of between 6 and 8 mg/L (ODEQ 1995). The aquatic invertebrates and other coldwater fish that rearing juvenile steelhead rely on for food require DO levels in this range. As temperatures increase and DO levels drop, these communities shift from salmonids and less tolerant aquatic invertebrates, such as mayflies and stoneflies, to a more coolwater structure dominated by sculpins and tolerant aquatic invertebrates such as chironomids.

In a study of high desert streams, Tait *et al.* (1994) found that less-palatable trout prey dominated the food base in warmwater stream reaches exposed to sunlight. In this study, Tait *et al*. (1994) reported that thick growths of filamentous algae encrusted with epiphytic diatoms were found in reaches with high instances of solar radiation, whereas low amounts of epilithic diatoms and blue-green algae dominated in shaded reaches. Periphyton biomass was significantly correlated with incident solar radiation. While densities of macroinvertebrates in forested streams typically increase in response to increased periphyton production, the effect of stimulated algal growth in rangeland streams is less clear. Tait *et al*. (1994) found that biomass, but not density, of macroinvertebrates was greater in reaches with greater periphyton biomass. The higher biomass was a consequence of many *Dicosmoecus* larvae, a large-cased caddisfly, that can exploit filamentous algae. Consequently, any potential benefits of increased invertebrate biomass to organisms at higher trophic levels, including salmonids, may be small, because these larvae are well protected from fish predation by their cases. Tait *et al*. (1994) suggest that these organisms may act as a trophic shunt that prevents energy from being transferred to higher trophic levels.

A study by Li *et al.* (1994) in the JDR basin, found that colder streams supported the highest standing crops of trout and had the most favorable trout: invertebrate standing crop ratios, suggesting that colder streams in this basin have a greater trophic efficiency leading to salmonid production. Inputs of fine sediment resulting from livestock trampling banks could also reduce benthic invertebrate abundance. Studies have shown that sediment inputs resulting in substrate embeddedness of greater than one third can result in a decrease in benthic invertebrate abundance and thus a decrease in food available for juvenile salmonids (Waters 1995).

Reducing riparian vegetation can also reduce habitat for terrestrial insects, an important food for juvenile salmonids (Platts 1991). Riparian vegetation also provides organic material directly to the stream, which makes up about 50% of the stream's nutrient energy supply for the food chain (Cummins 1974 *cited in* Platts 1991). This allochthonous material provides an important food source for aquatic insects, that in turn, become prey for salmonids. Consequently, removal of riparian vegetation can affect the diet of fish by reducing production of both terrestrial and aquatic insects (Chapman and Demory 1963).

<u>Substrate and Sediment</u>

Damage to streams in the western United States from livestock grazing is largely due to the generation of excess sediment caused by livestock overuse of riparian areas (Waters 1995). Cattle or sheep trampling streambanks and the subsequent erosion adds fine sediments to stream substrates. Mass wasting of sediment occurs along streambanks where livestock walk on overhanging cut banks (Behnke and Zarn 1976; Platts and Raleigh 1984; Fleischner 1994). At great risk are salmonid spawning reaches used by anadromous Pacific salmonids and inland trout (Waters 1995). Increases in fine sediment lead to greater substrate embeddedness and a decrease in the interstial spaces between gravel substrate important for MCR steelhead spawning. Increases in substrate embeddedness impair food production as described above, and block refugia for young salmonids (Rinne 1990). A general reduction of the quality of spawning and rearing habitat available occurs in these circumstances. Salmonid survival at early life stages has been directly linked to the amount of surface fines in stream substrates (EPA 1993). Juvenile salmonids are dependent on clean substrate for cover, especially for over-winter survival (EPA 1993). Successful salmonid spawning requires clean gravels with low fine sediment content (Spence *et al.* 1996).

Peak/ Base Streamflow

Channel downcutting caused by riparian degradation can lower local water tables and reduce the volume of base flow available in dry seasons and periods of drought (EPA 1993). Johnson (1992) reviewed studies related to grazing and hydrologic processes and concluded that heavy grazing nearly always decreases infiltration, reduces vegetative biomass, and increases bare soil. Decreased evapotranspiration and infiltration increases and hastens surface runoff, resulting in a more rapid hydrologic response of streams to rainfall. When this occurs, high flows in the spring tend to increase in volume, leading to bank damage and erosion. Summer and fall base flows are decreased, often resulting in flows that are insufficient to provide suitable rearing habitat for juvenile salmonids. If aquifers lose their capacity to hold water and slowly deliver water to the stream, differences between peak and base discharge rates increases dramatically (EPA 1993). Some streams that typically flowed perennially may experience periods of no flow in the summer or fall. Li *et al*. (1994) found that streamflow in a heavily grazed eastern Oregon stream became intermittent during the summer, while a nearby, well-vegetated reference stream in a similar-sized watershed had permanent flows. They suggested that the difference in flow regimes was a consequence of diminished interaction between the stream and floodplain with resultant lowering of the water table

Most riparian areas of the allotments addressed in this Opinion are not subject to densities of livestock sufficient to cause this degree of reduction in infiltration rates or change in streamflow regime. Experiments in northeastern Colorado showed reductions in infiltration in heavily grazed plots, but no differences between moderately and lightly grazed plots (Rauzi and Smith 1973). There are however, large meadow systems where livestock tend to congregate such as Flood Meadows in the Long Creek allotment and stringer meadow systems in the Murderers Creek allotment that could experience these types of effects if grazing is not tightly controlled.

Pool Quality/Quantity

Instream pools are important habitat for both juvenile and adult salmonids. Fish abundance is related to the diversity of habitats and number and quality of instream pools (EPA 1993). Rearing juvenile salmonids use slow water habitat found in pools, while adult salmonids make use of the cover and deep water found in pools during spawning migrations. Pools with undercut banks are important rearing areas for juvenile salmonids (Bjornn and Reiser 1991). These areas provide overhead cover and water velocities ideal for both juvenile and migrating adult salmonids. Bank trampling by livestock can destroy undercut banks, thereby reducing hiding cover for fish. Introduction of fine sediments to streams can fill in pools, reducing depth and covering coarse substrates. Reduction in the growth of woody species such as aspen and cottonwood along the stream's edge can lead to reductions in instream wood, thus diminishing the retention of spawning gravels and decreasing the frequency of pool habitats

2.1.5.1 Minimizing Effects from LAA Livestock Grazing

With the implementation of PACFISH in 1995, many riparian areas in the JDR basin have management programs in place to protect and enhance their condition. In an effort to avoid the above mentioned adverse effects that can result from improper livestock grazing, CORA has made many adjustments to their range program. The primary adjustment has been a general change from a season-long grazing strategy to a winter and spring grazing strategy. This is one effective technique to speed recovery and protect riparian areas from damage from livestock grazing. According to the BA, the majority of the perennial streams on the CORA-administered livestock grazing allotments are showing improving trends in grass, shrub growth, vigor, and streambank stability. These trends are noted through general observation and documented by photographs.

Permittees rely on salting, herding, and upland water sources to keep cattle away from unfenced riparian areas. Some information is available on the effectiveness of these techniques, but for the most part, results are conflicting. Erhart and Hansen (1997) cited three studies done in Oregon on the effectiveness of upland water sources and mineral supplements on reducing use of stream areas by cattle. In two studies, cattle use of stream areas was reduced by the use of these techniques while another study demonstrated that these techniques did not significantly alter cattle distribution in riparian areas. Riding and herding livestock away from riparian areas is a commonly used technique on FS allotments. Observations made during site visits and the end-of-year range tour suggest that this technique works well on some allotments but not as well on others. However, no specific information or data has been collected to support these observations.

Placing salt or mineral supplements in upland areas is often used to decrease the amount of time livestock spend in riparian areas. McInnis and McIver (2001) found that off-stream water and salt attracted cows to the uplands enough to significantly reduce the development of uncovered and unstable streambanks from 9% in non-supplemented pastures, to 3% in supplemented pastures. Ehrhart and Hansen (1997) provide anecdotal evidence that salt, when used in conjunction with alternate water sources, can help distribute livestock over open range, however, they stress that the mineral supplements must be placed far from streams (greater than 0.25 mile). In contrast, Bryant (1982) and Martin and Ward (1973) found that salt placement away from riparian areas did not significantly alter the amount of time livestock spent in riparian zones. Both studies conclude that use of mineral supplements alone will not influence livestock distribution appreciably.

Total rest from grazing can be one of the best alternatives for realizing rapid recovery of riparian areas (Leonard *et al*. 1997).

Fencing of sensitive riparian areas is an effective way of protecting riparian resources, fish habitat and fish populations. Platts (1991) found that in 20 of 21 studies identified, stream and riparian habitats were degraded by livestock grazing, and habitats improved when grazing was prohibited in the riparian zone. No fences protect riparian areas in the CORA allotments.

Monitoring and Establishing Utilization Standards

Regardless of the methods used to minimize effects of grazing, it is important to establish utilization standards and monitor in order to determine when specific methods to minimize effects should be implemented. Land management agencies such as the BLM and FS can establish utilization standards for livestock grazing in riparian areas. These standards provide "move triggers" for permitees as well as means to gauge the effects of grazing on RMOs. Typically, herbaceous residual stubble height is used as a standard to measure the utilization of riparian forage. In addition to residual stubble height, shrub utilization and bank damage estimates are also used as utilization standards. Permitees are instructed by land management agencies to move livestock when thresholds for utilization standards are approached or reached. Typically, stubble height utilization standards are set between 4 and 6 inches of residual stubble height. This means that as grazing in riparian areas begins to result in 4 to 6 inches of remaining herbaceous stubble height, livestock are moved to another unit or pasture. Sometimes stubble height measurements are taken on the most palatable species such as Kentucky bluegrass. Other times, hydric vegetation such as sedges and rushes growing along the streambank are measured.

Hall and Bryant (1995) state that as stubble height of the most palatable species reaches 3 inches, it should be assumed that unacceptable grazing use in riparian areas will begin. It should be pointed out that Hall and Bryant's method relies on measuring stubble height of the most palatable species, while the "move trigger monitoring" and the IIT protocol used by the land management agencies relies on stubble height measurements of hydric vegetation such as sedges and rushes. These plants are typically less palatable to livestock. For this reason, directly applying Hall and Bryant's 3-inch standard to monitoring stubble height of hydric vegetation is not appropriate. Normally, when hydric vegetation is measured, standards are set at between 4 and 6 inches.

When land management agencies formulate residual stubble height standards for units or pastures within a grazing allotment, two primary factors are considered. The first factor is the hydrologic function of the vegetation. Herbaceous vegetation plays an important role in maintaining and building streambanks. Stems of herbaceous vegetation slow stream current velocity during high flow events and facilitate sediment deposition, a process essential to the building of streambanks. Roots of herbaceous vegetation stabilize the soil and prevent erosion during high flow events. A study by Clary *et al.* (1996) found that in a simulated channel, residual stubble heights of 0.5 to 6 inches of flexible vegetation supported streambank rebuilding process within a single sediment loading and flushing. They also found that under multiple loading and flushing events, 8 to 12 inches of residual stubble height also entrapped and stabilized significant amounts of sediment.

The second factor considered when determining stubble height standards is the contribution the residual vegetation makes to healthy riparian habitat. Herbaceous vegetation provides many important functions in a healthy riparian ecosystem. Overhanging grasses, sedges, and rushes provide shade to the stream and hiding cover for fish. In meadow systems, herbaceous vegetation may be the only shade-providing plants. Overhanging herbaceous vegetation can also provide valuable overwintering habitat for juvenile salmonids. The presence of a healthy community of hydric vegetation in headwater wetland areas of watersheds also plays an important role in maintaining streamflow. The roots of this vegetation wick moisture into the soil during wet periods in the spring, maintaining a high water table. This water is then released gradually throughout the summer and fall, maintaining adequate streamflow during critical periods for juvenile salmonid growth and survival.

In grazed riparian systems, the presence of herbaceous vegetation prevents livestock from browsing hardwood shrubs. Clary and Leininger (2000) provide guidelines for establishing stubble height standards to avoid livestock browsing on hardwood shrubs but point out that residual stubble heights necessary to avoid browsing on shrubs depend on many factors, and can vary between 10 and 20 cm (approximately 4 to 8 inches).

Considering these factors, land management agencies establish residual stubble height utilization standards for each pasture. Clary and Leininger (2000) suggest starting with a 10 cm (approximately 4 inches) stubble height standard and then monitoring the area to determine if a change needs to be made to improve riparian conditions. They also state that in certain areas, 15 to 20 cm (approximately 6 to 8 inches) may be needed to protect streambanks sensitive to trampling or to protect riparian shrubs from browsing.

Setting proper utilization guidelines requires trial and error through focused monitoring, analysis, and evaluation of the results after adjusting management (Leonard *et al.* 1997). Current research on livestock grazing in riparian areas indicates that these utilization standards are a good place to start, however, monitoring is necessary to validate that riparian objectives are being met under current standards. CORA is gathering this information, but it will be several more years until effectiveness monitoring results will indicate whether the current standards are sufficient to meet RMOs.

Many authors have concluded that efforts of operators (permittees) and managers (in this case, the CORA) are more important than any particular system or approach to meeting objectives for livestock grazing in riparian areas (Ehrhart and Hansen 1997). NOAA Fisheries believes that consistent and accurate monitoring of the CORA range program activities is essential to minimizing and avoiding take of MCR steelhead and meeting the requirements of PACFISH (USDA and USDI 1995).

LAA Allotment-Specific Effects

Belshe Allotment

Grazing will occur on this allotment from March 1 to May 1. MCR steelhead spawning occurs in Little Ferry Canyon within the Little Ferry Pasture. There is a potential for interference with MCR steelhead spawning and/or redd trampling in this pasture. Since this allotment is grazed in the spring, riparian condition should continue to improve. Riparian photos previously taken in 1981 and 1990, will be repeated in 2005 to determine if riparian condition is improving as expected.

C.H. Hill Allotment
Grazing will occur on this allotment from April 1 to May 31. MCR steelhead spawning occurs in Bologna Creek in the Bologna Creek Pasture. There is a potential for interference with MCR steelhead spawning and/or redd trampling in this pasture. Since this allotment is grazed in the spring, riparian condition should continue to improve. In 2005, riparian photos of Bologna Creek will be taken upstream and downstream every 0.25 mile in the Bologna Creek Pasture to document riparian condition.

Crown Rock Allotment
Grazing will occur on this allotment from April 15 to May 1, or May 2 to May 30, and from October 15 to December 15. MCR steelhead spawning occurs in Bear Creek within the Bear Creek Pasture. There is a potential for interference with MCR steelhead spawning and/or redd trampling in this pasture. Since this allotment is grazed in late fall and spring, riparian condition should continue to improve as documented with the 2003 photos. Riparian photos previously taken in 1987, 1992, and 2003, will be repeated in 2006, to determine if riparian condition is improving as expected.

Eakin Allotment
Grazing will occur on this allotment from April 1 to June 30. MCR steelhead spawning may occur in Jackknife Canyon within the Jackknife Pasture during abundant water years. There is a potential for interference with MCR steelhead spawning and/or redd trampling in this pasture. Since this allotment is grazed in the spring, riparian condition should continue to improve. Riparian photos previously taken in 1980 and 1990, will be repeated in 2005, to determine if riparian condition is improving as expected.

Pine Creek Allotment
Grazing will occur on this allotment throughout the year, from March 1 to February 28. MCR steelhead spawning occurs in Pine Hollow and Long Hollow creeks within Porter Canyon, Cramer Canyon, and Bath Canyon pastures. There is a potential for interference with MCR steelhead spawning and/or redd trampling in this pasture. The year-long season of use, may result in the degradation of MCR steelhead habitat indicators occurring on this allotment. Riparian photos previously taken in 1980 and 1990, in the Cramer Canyon and Bath Canyon pastures will be taken in 2004 to determine the trend of and current riparian condition. In 2004, riparian photos of Pine Hollow Creek will be taken upstream and downstream every 0.25 mile in the Porter Canyon Pasture to document riparian condition. On and off dates for the Porter Canyon, Cramer Canyon, and Bath Canyon pastures will be determined and riparian stubble height, bank damage, and shrub utilization standards will be used to determine when cows should be moved out of the pastures.

Pryor Farms Allotment
Grazing will occur on this allotment from April 1 to November 4. MCR steelhead spawning occurs in Hay Creek within the North Pasture. There is a potential for interference with MCR steelhead spawning and/or redd trampling in this pasture. The long season of use, is retarding the attainment of properly functioning condition of MCR steelhead habitat indicators occurring

on this allotment. Riparian photos previously taken in 1980, 1990, and 2003, in the North Pasture will be taken in 2006 to determine the trend of and current riparian condition. On and off dates for the North Pasture will be determined and riparian stubble height, bank damage, and shrub utilization standards will be used to determine when cows should be moved out of the pasture.

Summary of Effects

Livestock grazing in riparian area, if not carefully controlled or managed, can have numerous, and in some cases severe, adverse effects to fish and their habitat. It is reasonably certain that some localized degradation of MCR steelhead habitat indicators will occur on the LAA allotments. NOAA Fisheries believes that appropriate monitoring and adapting management in response to overutilization through moving cattle, salting, herding, providing alternative water sources, and fencing if necessary are sufficient to keep this degradation to a minimum, and when assessed at a watershed scale, improvement of habitat indicators is expected. CORA will continue to identify areas where riparian habitat is being impacted and adjust grazing practices accordingly.

2.1.6 Cumulative Effects

"Cumulative effects" are defined in 50 CFR 402.02 as those effects of "future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." The "action area" for this consultation is identified in section 2.1.4 of this Opinion.

The only known state or private activities that are reasonably certain to occur within the action area are future grazing and agricultural activities on private land within the action area. Significant improvement in MCR steelhead reproductive success outside of federally-administered land is unlikely without changes in grazing, agricultural, and other practices occurring within non-federal riparian areas in the JDR basin. Until improvements in non-federal land management practices are actually implemented, NOAA Fisheries assumes that future private and state actions will continue at similar intensities as in recent years and as a result will maintain degraded MCR steelhead habitat conditions on non-federal land.

2.1.7 Conclusion

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402 (the consultation regulations). NOAA Fisheries must determine whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NOAA Fisheries must consider the estimated level of mortality attributable to: (1) Collective effects of the proposed or continuing action; (2) the environmental baseline; and (3) any cumulative effects.

NOAA Fisheries has determined that, when the effects of the subject actions addressed in this Opinion are added to the environmental baseline and cumulative effects occurring in the action area, they are not likely to jeopardize the continued existence of MCR steelhead. These conclusions were reached primarily because: (1) Most relevant aquatic habitat indicators on the CORA-administered livestock grazing allotments along the mainstem JDR and tributaries, addressed in this Opinion are expected to be maintained under current grazing regimes and monitoring strategies, and relevant aquatic habitat indicators are improving in some pastures; (2) available CORA monitoring data indicate that implementation of spring grazing strategies have resulted in improvement in riparian vegetation conditions on some allotments; (3) although available data shows that some trampling of MCR steelhead redds may occur, and the percentage of redds potentially trampled can be high in certain channel types (meadow areas, C-type stream channels), improvements in riparian condition resulting from improved livestock management on CORA-administered livestock grazing allotments containing or beside MCR steelhead spawning areas are expected to minimize the number of redds trampled by livestock; and (4) improvements in riparian vegetation, stream shading, and streambank stability in many areas, aquatic habitat indicators such as water temperature, sediment, substrate embeddedness, width/depth ratio, and streambank condition are expected to be improved and be restored over the long term on JDR tributary streams. In reaching these conclusions, NOAA Fisheries has used the best scientific and commercial data available as documented herein and by the BA describing the Federal actions.

2.1.8 Conservation Recommendations

Section 7 (a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of a proposed action on listed species or to develop additional information. NOAA Fisheries believes that the following conservation recommendation regarding livestock grazing should be implemented:

1. Review the range improvement budget annually, and give top priority to restoring riparian areas along streams containing MCR steelhead habitat by development of off-channel water sources and cattle-exclusion devices.

2. Review all allotments for opportunities to allow for rest, additional rest, or additional rest of high-priority pastures. Use the results of that review to reduce grazing impacts by making allotment management changes, such as implementing more efficient grazing systems, restructuring pasture boundaries, and increasing the number of pastures within an allotment.

3. When unauthorized[1] or excess[2] use by livestock occurs on BLM land in areas providing MCR steelhead habitat, notify the owner of the cattle to remove the livestock immediately. Also notifiy NOAA Fisheries Habitat Division within 24 hours. The BLM should use any and all administrative and law enforcement capabilities to remove the unauthorized livestock as soon as possible.

2.1.9 Reinitiation of Consultation

Reinitiation of consultation is required if: (1) The action is modified in a way that causes an effect on the listed species that was not previously considered in the BA or this Opinion; (2) new information or project monitoring reveals effects of the action that may affect the listed species in a way not previously considered (*e.g.,* excessive riparian impacts in spring grazing allotments); (3) a new species is listed or critical habitat is designated that may be affected by the action;
(4) riparian utilization standards are not being met on the season-long Pine Creek and Pryor Farms Allotments at the end of the 2005 grazing season (if this occurs, reinitiation will only be necessary on the Pine Creek and Pryor Farms Allotments); or (5) the amount or extent of take specified in the incidental take statement is exceeded (50 CFR. 402.16). This consultation does not cover any grazing after 2008. To reinitiate consultation, CORA must contact the NOAA Fisheries Habitat Conservation Division, Oregon State Habitat Office and refer to **2003/01484**.

2.2 Incidental Take Statement

The ESA at section 9 [16 USC 1538] prohibits take of endangered species. The prohibition of take is extended to threatened anadromous salmonids by section 4(d) rule [50 CFR 223.203]. Take is defined by the statute as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” [16 USC 1532(19)] Harm is defined by regulation as “an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavior patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering.” [50 CFR 222.102] Harass is defined as “an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering.” [50 CFR 17.3] Incidental take is defined as “takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant.” [50 CFR 402.02] The ESA at section 7(o)(2) removes the prohibition from any incidental taking that is in compliance with the terms and conditions specified in a section 7(b)(4) incidental take statement [16 USC 1536].

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[1] Unauthorized use is any incident whereby livestock owned by a non-permittee enter onto the Federal lands.

[2] Excess use is any incident whereby livestock owned by a permittee holding a grazing permit are found in areas or at times other than shown on the grazing permit or otherwise authorized under a bill for collection. NOAA Fisheries also considers use by greater numbers of cattle than allowed by the grazing permit to be excess use.

2.2.1 Amount or Extent of Take

NOAA Fisheries anticipates that the subject grazing actions covered by this Opinion are reasonably certain to result in incidental take of MCR steelhead. Some level of incidental take is expected to result from livestock grazing due to cattle trampling of MCR steelhead redds, disturbance of spawning adult steelhead, or frightening of juvenile MCR steelhead from cover by livestock wading in streams. Some localized riparian habitat disturbance is also reasonably certain to occur in the allotments addressed in this Opinion. Take of MCR steelhead could result from increased stream temperatures, decreased dissolved oxygen levels, or smothering of eggs by fine sediments as a result of riparian disturbance caused by livestock grazing. Because of the inherent biological characteristics of aquatic species such as MCR steelhead, however, the likelihood of discovering take attributable to these actions is very small. Effects of actions such as those addressed in this Opinion are largely unquantifiable in the short term, and may not be measurable as long-term effects on the species' habitat or population levels. Therefore, even though NOAA Fisheries expects some incidental take to occur due to the actions covered by this Opinion, the best scientific and commercial data available are not sufficient to enable NOAA Fisheries to estimate a specific amount of incidental take of listed fish at any life stage.

2.2.2 Effect of the Take

In this Opinion, NOAA Fisheries has determined that the level of anticipated take is not likely to result in jeopardy to MCR steelhead.

2.2.3 Reasonable and Prudent Measures

NOAA Fisheries believes the following reasonable and prudent measures are necessary and appropriate to minimize the likelihood of take of MCR steelhead resulting from the actions covered in this Opinion. CORA shall:

1. Minimize the likelihood of incidental take resulting from livestock grazing and associated activities by managing livestock grazing allotments such that direct effects of livestock on spawning adult MCR steelhead, steelhead eggs, and pre-emergent fry in streams on or beside those allotments are avoided or minimized.

2. Minimize the likelihood of incidental take resulting from livestock grazing and associated activities by managing livestock grazing allotments such that direct and indirect effects of livestock on important components of MCR steelhead habitat are avoided or minimized.

3. Complete a comprehensive monitoring and reporting program to ensure implementation of conservation measures found in this Opinion.

2.2.4 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, CORA must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. To implement reasonable and prudent measure #1 (direct effects of livestock on spawning adult MCR steelhead, steelhead eggs, and pre-emergent fry), CORA shall:

    a. Conduct spawning surveys on Hay Creek in the Sixmile and Pryor Farms Allotments and Bear Creek in the Crown Rock Allotment. If redds are found, return to the area biweekly to provide data demonstrating whether cattle under the current grazing strategy are trampling MCR steelhead redds.
    b. Monitor incidental take in the Pine Creek Allotment by requesting that ODFW report to CORA staff incidents of cattle trampling redds on CORA land in Pine Hollow and Long Hollow Creeks.
    c. If redd trampling is observed in any allotment, minimize take of MCR steelhead by protecting MCR steelhead redds observed within 20 feet of cattle watering sites or stream crossings by controlling cattle access to the redd until cattle are removed from the pasture or emergence has occurred, to prevent further trampling.

2. To implement reasonable and prudent measure #2 (direct and indirect effects of livestock on important components of MCR steelhead habitat), the CORA shall:

    a. Consistently implement grazing-related standards and guidelines listed in PACFISH to achieve RMOs regarding bank stability, water temperature, large woody material, lower bank angle, width/depth ratio and other aquatic habitat parameters which may be affected by livestock grazing.
    b. Monitor the level of incidental take associated with indirect riparian habitat effects by taking upstream and downstream 0.25 mile riparian photos on streams and pastures as scheduled in the Table 6.
    c. Minimize incidental take associated with habitat alteration by maintaining a minimum greenline stubble height of 4 inches along Hay Creek in the North Pasture of the Pryor Farms Allotment.
    d. Determine dates that livestock are turned into the Porter Canyon, Cramer Canyon, and Bath Canyon Pastures of the Pine Creek Allotment, and coordinate a Level 1 site visit to these pastures to determine appropriate utilization standards (4-inch riparian stubble height, 10% bank damage, or woody utilization) to use as triggers for eliminating cattle access to riparian areas of Pine Hollow and Long Hollow Creeks, and to determine trigger monitoring schedule. Apply these triggers and prevent cattle access to riparian areas as necessary to meet utilization standards.

Table 6. Riparian Photo Schedule for LJDR LAA Allotments

Allotment	Pasture	Stream	Photo to be Taken[1]
Pine Creek	Bath Canyon	Long Hollow Creek	2004
	Cramer Canyon	Pine Hollow Creek Long Hollow Creek	2004
	Porter Canyon	Pine Hollow Creek	2004
Belshe	Little Ferry	Little Ferry Canyon	2005
Eakin	Jackknife	Jackknife Canyon	2005
C.H. Hill	Bologna Creek	Bologna Creek	2005
Crown Rock	Bear Creek	Bear Creek	2006
Pryor Farms	North	Hay Creek	2006
Sixmile	Hay Creek	Hay Creek	2008

[1] Photos should be taken at the end of grazing season, or September in the case of the Pine Creek and Pryor Farms Allotments.

e. Meet all requirements and fully implement the 2000 Grazing Implementation Monitoring Module, 2002 amendments to the module, and the piloted Effectiveness Monitoring Module.

f. Provide the necessary training for all permittees and range riders to monitor livestock use and pasture move “triggers” (stubble height, woody utilization, and bank damage).

3. To implement reasonable and prudent measure #3 (monitoring and reporting), CORA shall:

a. Provide an end-of-year report to NOAA Fisheries by December 1 of each year. The following shall be included in the report for each allotment:
   i. Overview of proposed action and actual management (livestock numbers, on-off dates for each pasture, and strategy).
   ii. Results of redd trampling monitoring including any reported by ODFW.
   iii. Specific CORA implementation monitoring data, date, and location collected (stubble height, woody use, bank damage, and unauthorized use).
   iv. Results from all vegetative trend study plots and vegetative utilization study sites.
   v. Most recent photos documenting trend at riparian photopoints.
   vi. Specific permittee monitoring data.

vii. Review of management and compliance successes and failures and any transmittals/letters/actions addressed to/from permittees.
vii. New habitat trend or MCR steelhead population data.
viii. Compliance with each pertinent term and condition contained in this Opinion.
ix. Management recommendations for subsequent years.

b. Review the adequacy of the monitoring program for determining riparian condition trends, specifically focus on the frequency of monitoring and types of monitoring used.

c. Prepare and submit checklist to the Level 1 Team summarizing all the monitoring and survey efforts required by this Opinion. This will allow the Level 1 Team to track monitoring efforts throughout the grazing season and ensure all required and proposed monitoring is completed.

d. Conduct a July site visit with NOAA Fisheries to the North Pasture in the Pryor Farms Allotment. The visit's purpose is to review assess compliance with the requirements of this Opinion. A summary of the site visit will be developed by the Level 1 Team and provided in the end-of-year grazing monitoring report.

e. Provide an end-of-year grazing tour in the fall with NOAA Fisheries. The tour's purpose is to review successes and failures of the current year's grazing activities, and develop recommendations for future activities. A summary of the grazing tour will be provided in the end-of-year report.

f. Send the completed report to:

National Marine Fisheries Service
Oregon State Habitat Office
Attn: Scott Hoefer, 2003/01484
525 NE Oregon Street
Portland, OR 97232

g. NOTICE. If a dead, injured, or sick endangered or threatened species specimen is found, initial notification must be made to the National Marine Fisheries Service Law Enforcement Office, at Vancouver Field Office, 600 Maritime, Suite 130, Vancouver, Washington 98661; phone: 360.418.4246. Care should be taken in handling sick or injured specimens to ensure effective treatment and care or the handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death. Besides the care of sick or injured endangered and threatened species, or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence with the specimen is not unnecessarily disturbed.

3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

3.1 Background

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), requires the inclusion of EFH descriptions in Federal fishery management plans. In addition, the MSA requires Federal agencies to consult with NOAA Fisheries on activities that may adversely affect EFH.

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA section 3). For the purpose of interpreting the definition of essential fish habitat: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include aquatic areas historically used by fish where appropriate. "Substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities. "Necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem, and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.110).

Section 305(b) of the MSA (16 U.S.C. 1855(b)) requires that:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;

- NOAA Fisheries shall provide conservation recommendations for any Federal or state activity that may adversely affect EFH;

- Federal agencies shall within 30 days after receiving conservation recommendations from NOAA Fisheries provide a detailed response in writing to NOAA Fisheries regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NOAA Fisheries, the Federal agency shall explain its reasons for not following the recommendations.

The MSA requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and up slope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NOAA Fisheries is required by Federal agencies undertaking, permitting or funding activities that may adversely affect EFH, regardless of its location.

3.2 Identification of EFH

The Pacific Fisheries Management Council (PFMC) has designated EFH for federally-managed fisheries within the waters of Washington, Oregon, and California. The PFMC has designated EFH for three species of Pacific salmon: Chinook salmon (*O. tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other waterbodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). In estuaries and marine areas, designated salmon EFH extends from the near shore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (370.4 km) offshore of Washington, Oregon, and California north of Point Conception to the Canadian border. Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the *Pacific Coast Salmon Plan* (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based on this information.

3.3 Proposed Actions

The proposed action is detailed above in section 1.2 of this document. The action area is identified in section 2.1.4 of the ESA portion of this document. These areas within the LJDR subbasin have been designated as EFH for various life stages of chinook salmon.

3.4 Effects of Proposed Action

As described in detail in the ESA portion of this consultation, the proposed activities may result in detrimental short-term adverse effects to a variety of habitat parameters.

3.5 Conclusion

NOAA Fisheries believes that the proposed action will adversely affect EFH for chinook salmon.

3.6 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. The conservation measures proposed for the project by CORA, all of the reasonable and prudent measures and the terms and conditions contained in sections 2.2.3 and 2.2.4 are applicable to salmon EFH. Therefore, NOAA Fisheries incorporates each of those measures here as EFH conservation recommendations.

3.7 Statutory Response Requirement

Please note that the MSA (section 305(b)) and 50 CFR 600.920(j) requires the Federal agency to provide a written response to NOAA Fisheries after receiving EFH conservation recommendations within 30 days of its receipt of this letter. This response must include a description of measures proposed by the agency to avoid, minimize, mitigate or offset the adverse impacts of the activity on EFH. If the response is inconsistent with a conservation recommendation from NOAA Fisheries, the agency must explain its reasons for not following the recommendation.

3.8 Supplemental Consultation

CORA must reinitiate EFH consultation with NOAA Fisheries if either action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920).

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